

Installing and Maintaining the HRPSU

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Chapter 1

Overview of the HRPSU

This chapter describes the HRPSU (High Power Redundant Power Supply Unit) power rack and power supply module, and describes preparing for installation.

Introduction to the HRPSU

The HRPSU is a hot-swappable power supply that provides uninterrupted operation to network devices in the event of a network device power supply failure. The HRPSU is a standalone unit that can support up to four network devices equipped with redundant power supply outlets.

The HRPSU is a modular system consisting of a power rack (Order No. AA0002001) with slots for four power supply modules (Order No. AA0005003). You can install as many modules as needed, between one and four, in the power rack. Figure 1-1 shows an HRPSU with all four power supply modules installed.

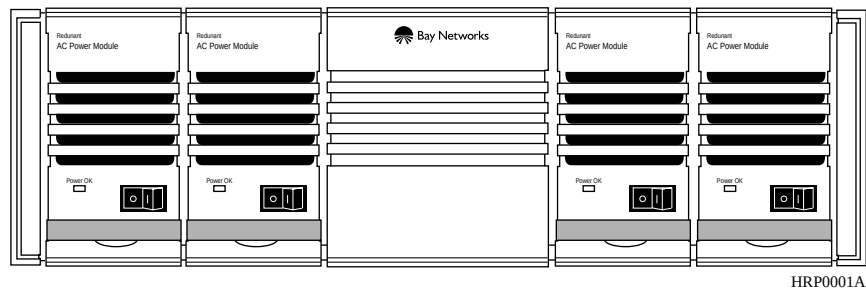


Figure 1-1. HRPSU (High Power Redundant Power Supply Unit)

The HRPSU supports devices requiring up to 210 watts of power, as well as those with lower power requirements. Each power supply module in the HRPSU operates independently. For example, if you need to replace a power supply module, you can turn off that module's power switch, leaving the other modules operational.

Figure 1-2 shows the front of the HRPSU with the front panels removed from two slots, and a power supply module. The blank front panel on each power supply slot normally remains on the HRPSU until a module is installed. The power supply module, which has a permanent front panel, is provided with a latch for handling the module and for keeping it in place during operation.

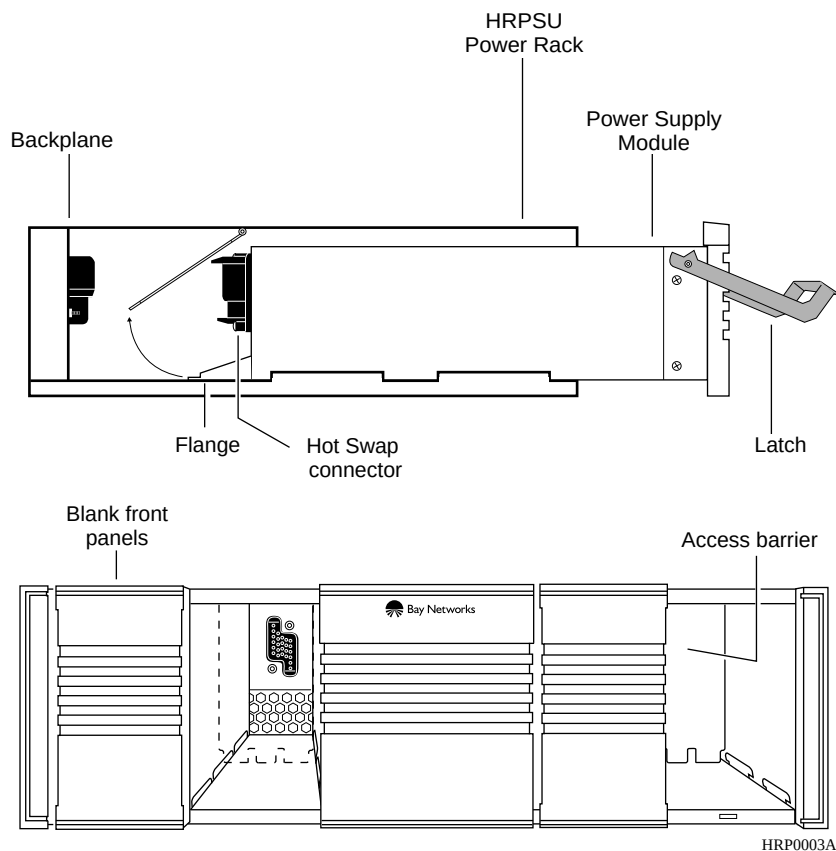


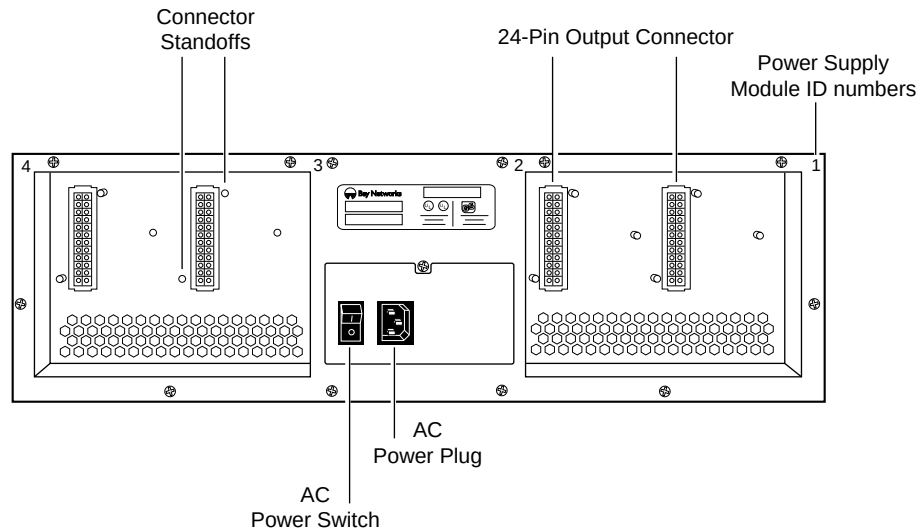
Figure 1-2. HRPSU Power Rack and Power Supply Module

Hot-swap connectors on each power supply module connect the input and output signals of the power supply to the power rack backplane. The hot-swappable feature allows you to install the HRPSU without turning off the power to the network devices. Redundancy is provided with no down-time on the network.

A safety door inside each power supply slot prevents hands or other objects from touching the connector on the backplane. In Figure 1-2, the open slot on the right shows a safety door in locked position. The open slot on the left shows the power supply connector on the backplane.

When you insert a power supply module into the slot, the flange on the rear of the module releases the safety door, allowing the module to connect to the backplane. The module's power switch, located on the front panel, is recessed deeply to prevent you from accidentally turning off the module.

Figure 1-3 shows the rear of the HRPSU power rack. Each power supply slot is identified by a number (1 - 4) stamped into the metal at the back upper edge of the HRPSU power rack.



HRP0002A

Figure 1-3. Rear View of HRPSU

For network devices that use 16-pin cables, you must install a connector adapter to attach the cable to the HRPSU.

Depending on the particular network device type, the HRPSU attaches to network devices using 16-pin cables or 24-pin cables. For example:

- The ASN uses a single 24-pin cable.
- BayStack and Distributed 5000 device's use a single 16-pin cable.
- The 28000 family devices use two 16-pin cables.

Standoffs are provided for 24-pin cable connections, and for attaching 16-pin adapters for those network devices using 16-pin cables. Once all cabling is complete and the AC power is turned on, the HRPSU is enabled; signals automatically sent to the network device inform it of the presence of the HRPSU -- no other setup is required.

The HRPSU power switch turns off all power to the unit. The AC power cord plugs into a wall outlet. This allows the network device to have an AC power source separate from the HRPSU. The HRPSU requires a dedicated 15-A branch circuit for 120-V AC power service.

North American and Japanese users need to use the Bay Networks 15-A power cords for their countries (Order Nos. AA0018020 and AA0020001, respectively). All other countries use the standard Bay Networks 10-A power cord, at 240 V AC, for their particular country.

Preparing for Installation

Before you install the HRPSU:

- Check your shipment.
 - Verify that the items you received match the packing list attached to the shipping container.
 - Inspect all items for damage.

If any parts are missing or damaged, contact the Bay Networks Technical Response Center for assistance.

- Make sure that your site meets the electrical requirements described in Appendix A.

- Review the installation procedures in Chapter 2. Read all safety sheets included with the shipment, and the caution and warning labels on the unit. Observe all safety precautions.

A Phillips screwdriver is required for some installation procedures.

Chapter 2

Installing the HRPSU

This chapter describes

- Cabling options for network devices
- Mounting the HRPSU in a surface stack or in a rack
- Installing power supply modules in the HRPSU
- Installing an adapter for 16-pin cables
- Connecting a network device to the HRPSU
- Switching on and verifying power connection

Cabling Options

There are three options for cabling a network device to an HRPSU power supply module. Table 2-1 explains the options and indicates the figure that illustrates each one.

Depending on your network device, you will use 24-pin cables, or 16-pin cables with an adapter. Refer to the figure for the cabling option that applies to your device.

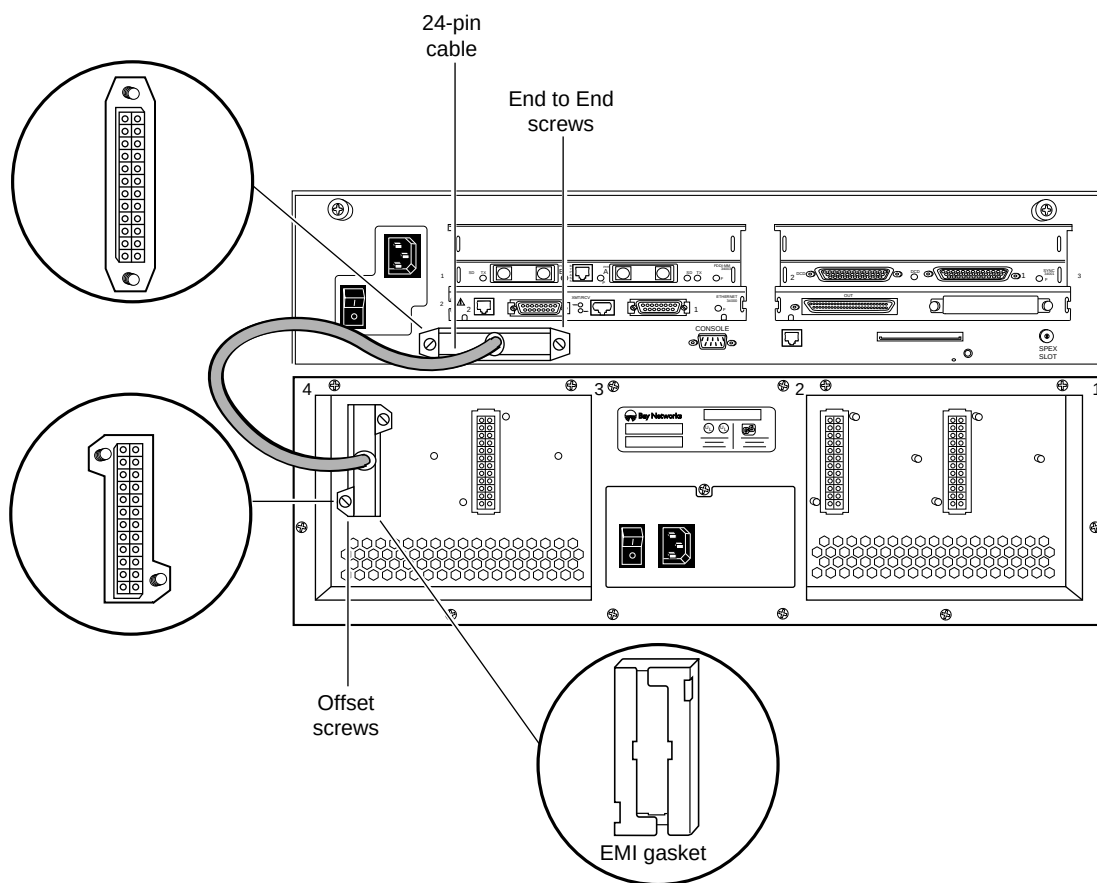
Table 2-1. Options for Cabling a Network Device

To Connect	Cable Type	Number of Cables Used	Figure Number
ASN	24-Pin	1	Figure 2-1
5000 Device	16-Pin	1	Figure 2-3
28000 Device	16-Pin	2	Figure 2-4

Using One 24-Pin Cable

[Figure 2-1](#) shows the cabling between a single 24-pin redundant power connector on a network device and one HRPSU power supply module. This type of connection provides up to 210 W.

Notice that the connector ends are different. The end with end-to-end screws attaches to the network device; the end with offset screws attaches to the HRPSU. An EMI gasket is supplied with the cable (see figure). You place the gasket over the connector on the power supply module before you plug in the cable.



HRP0011A

Figure 2-1. Cabling with One 24-Pin Cable

Installing an Adapter for 16-Pin Cables

If your network device uses 16-pin cables, you must install an adapter to connect the cable to the HRPSU. [Figure 2-2](#) shows an adapter. The adapter has two 16-pin connections, labeled P1 and P2. Network devices that require the use of two 16-pin cables attach to both connections on the adapter (P1 and P2); devices using a single 16-pin cable attach to the bottom (P1) connection.

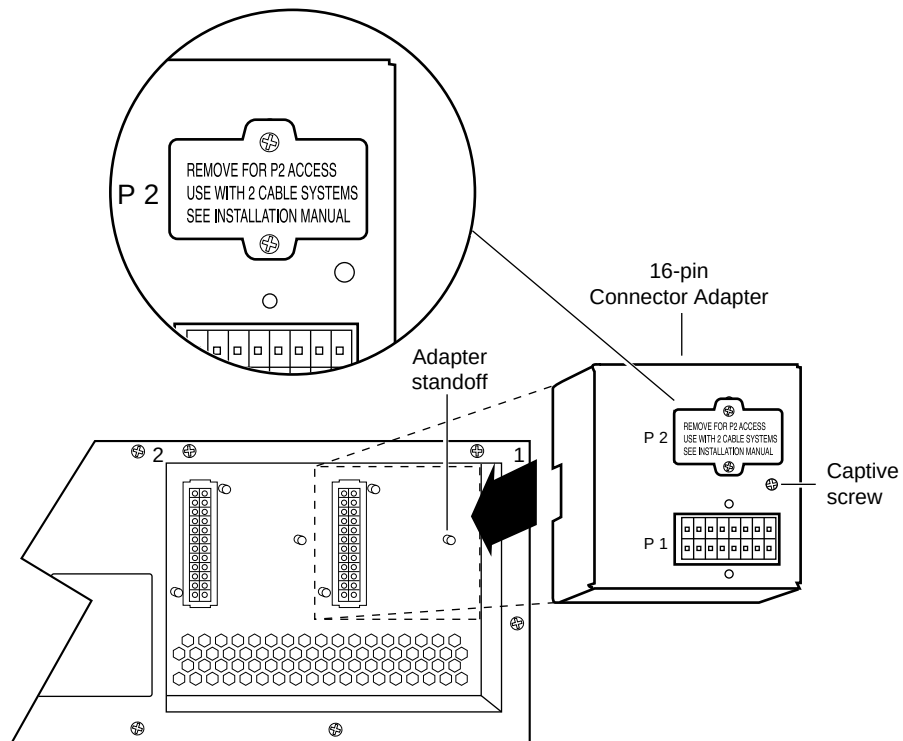


Figure 2-2. Adapter for 16-Pin Cable Connections



Note: By default, the adapter for 16-pin cable connections is shipped with a protective cover over the P2 connection. If your network device requires two 16-pin connections, you must remove this cover before attempting to attach the second network device cable.

You can install up to four adapters on the HRPSU; however, only one network device may be attached to each adapter.



Note: If there is an EMI gasket on the 24-pin connector, remove it first.

1. **Place the adapter over any 24-pin output connector on the HRPSU, as shown in Figure 2-2, and firmly press the 16-pin adapter connector into the HRPSU 24-pin connector.**
2. **Insert and tighten the captive screw supplied for the adapter.**

Using One 16-Pin Cable

[Figure 2-3](#) shows the cabling between a single 16-pin redundant power connector on a network device and an HRPSU power supply module using an adapter. This type of connection provides up to 130 W.

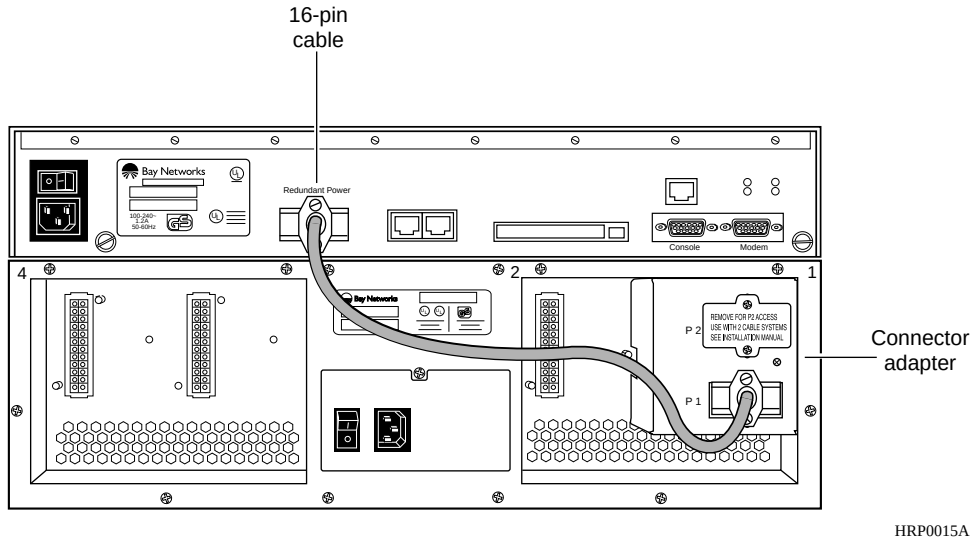


Figure 2-3. Cabling with One 16-Pin Cable



Note: When using a single 16-pin cable, plug the cable into the *lower* connector on the adapter (P1).

Using Two 16-Pin Cables

[Figure 2-4](#) shows the cabling between two 16-pin redundant power connectors on a network device and an HRPSU power supply module using an adapter. This type of connection provides up to 210 W.

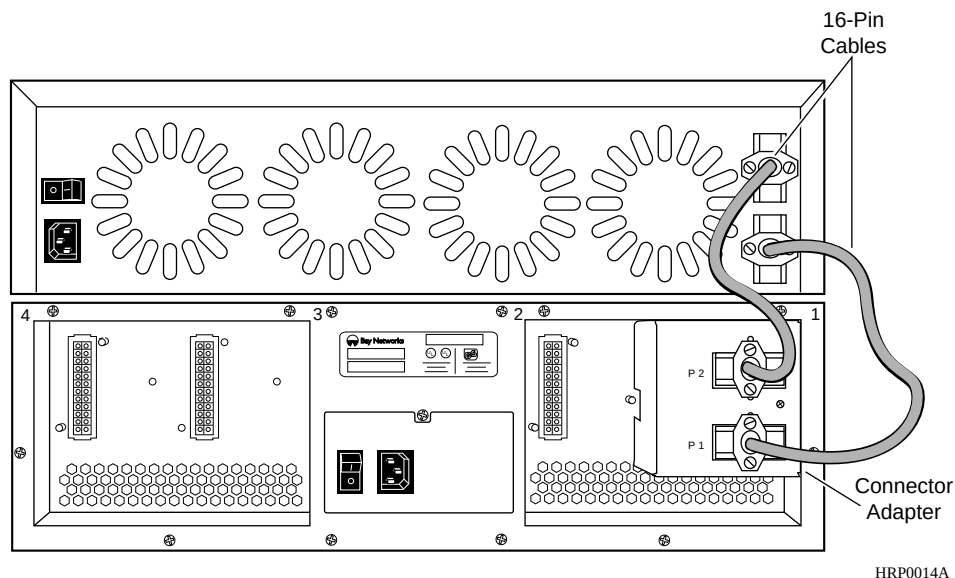


Figure 2-4. Cabling with Two 16-Pin Cables

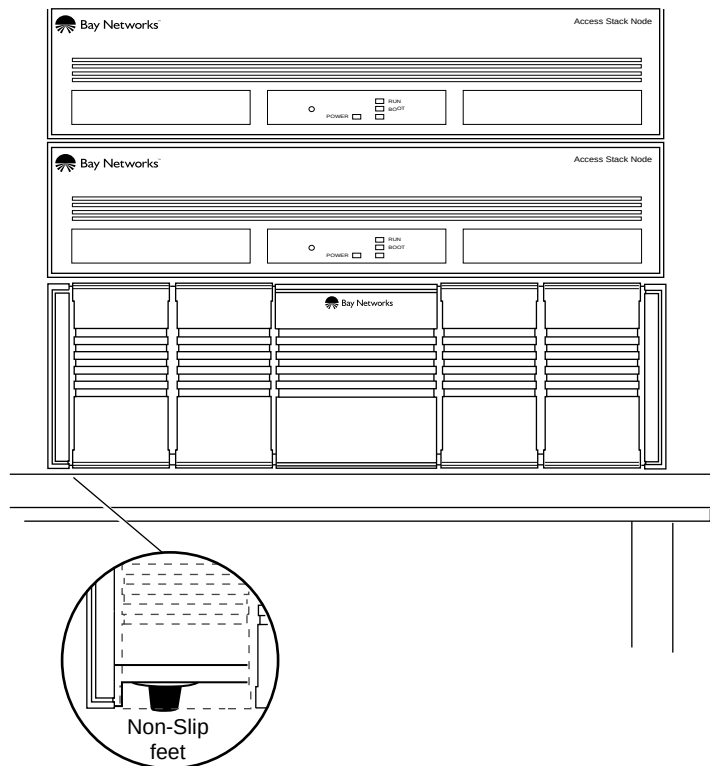
Mounting the HRPSU

You can mount the HRPSU on a flat surface or in a stack with other network devices. The HRPSU is normally installed at the bottom of a stack, or in a rack below the devices you intend to attach to it. Your only restriction (as far as where you place the HRPSU) is the length of cabling necessary to attach the device.

You mount the HRPSU before installing the power supply modules. Once it is in place, you install all of your power supply modules, then attach the cables to the network device(s) and the HRPSU.

Mounting the HRPSU on a Surface

The HRPSU does not require any preparation or tools for mounting on a solid surface. Sturdy non-slip feet are built into the unit to provide a firm grip on the surface. [Figure 2-5](#) shows an HRPSU installed at the bottom of a stack of ASNs.



HRP0005A

Figure 2-5. HRPSU Mounted on a Surface

To mount the HRPSU under a stack of devices, place the unit on a surface that will support the power supply and the network devices you intend to attach to it (refer to Appendix A for the weight of the HRPSU power rack and modules). Set the network device(s) on the HRPSU.

Mounting the HRPSU in a Rack

This procedure requires

- Three hardware packages from the HRPSU shipment. The packages you need contain the angle brackets, flanges, mounting screws, and cagenuts.
- A Phillips screwdriver.
- An electronic enclosure rack that meets the specifications listed in Table A-1, Appendix A.

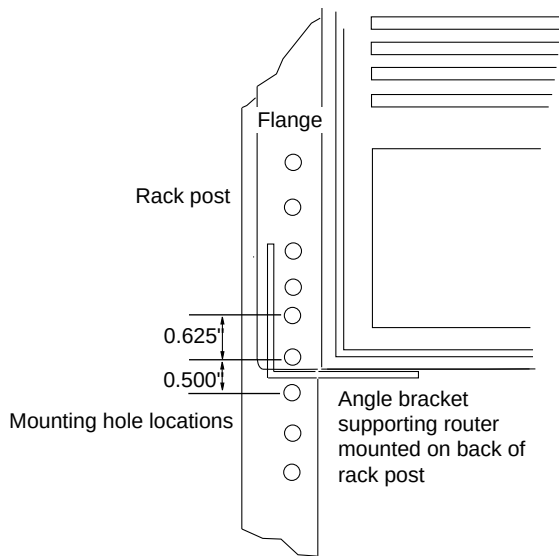
When you have the required equipment, to install the HRPSU in a rack:

1. Measure at least 5.25 in. (13.3 cm) of free vertical space inside the rack.

If you plan to stack the HRPSU with ASNs, multiply 5.25 in. by the number of nodes in the stack. Then make sure the rack has enough (contiguous) free vertical space for the stack.

2. Locate the nearest two rail holes, below the area you just measured, that are 0.50 in. (1.27 cm) apart.

The hole in the flange that you install on the HRPSU (in Step 4) will align with the rail holes as shown in [Figure 2-6](#).



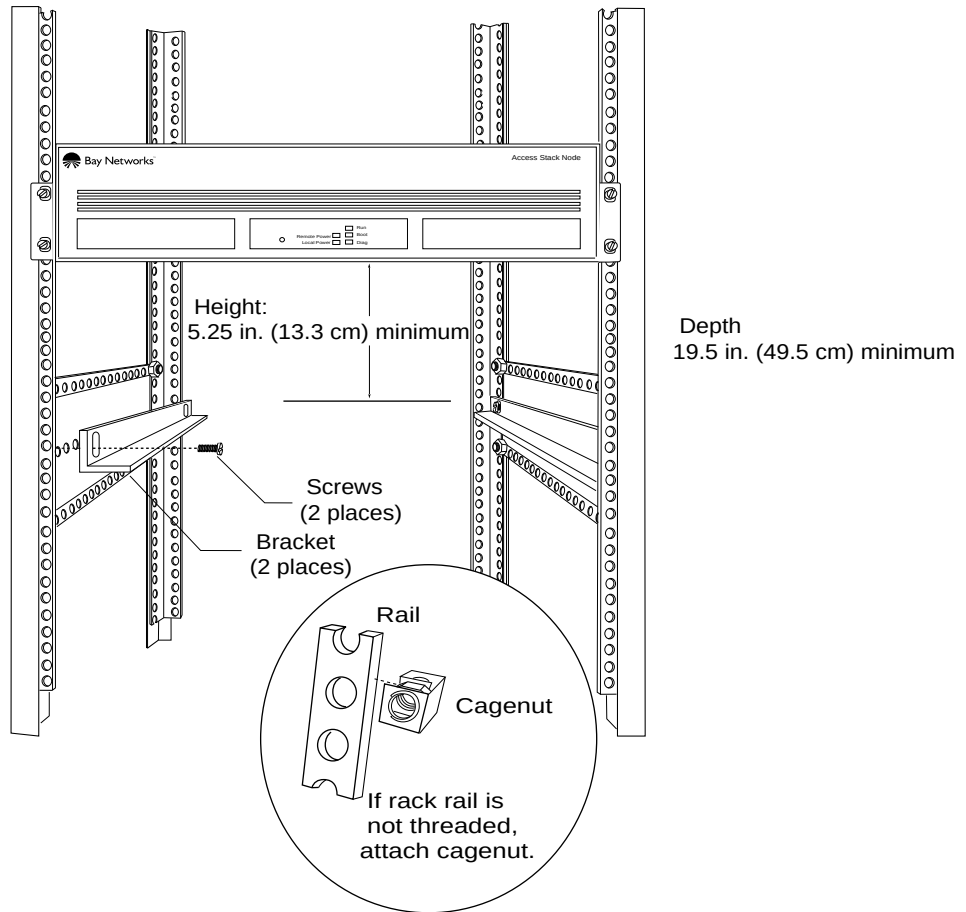
ASN0001A

Figure 2-6. Locating the Rail Holes

3. **Insert each angle bracket inside the rack in the area indicated in [Figure 2-7](#).**

Using [Figure 2-7](#) as a guide, attach the angle brackets as follows:

- a. **If there are no threads in the rail holes where you will attach the angle brackets, insert four cagenuts over the holes.**
- b. **Align the edge of the bracket to the rack.**
If the interior of the rack has horizontal bracket supports, align the angle brackets with the supports. Otherwise, brace the angle brackets between the side rails.
- c. **Insert a 10-32 screw through the slots at each end of the bracket and into the holes in the rack supports. Do not tighten the screws.**
- d. **Adjust each bracket vertically along the bracket slots until the bracket is 0.78 in. (1.98 cm) below the center of one hole in the front vertical support of the rack.**
- e. **Tighten the screws with a Phillips screwdriver.**



ASN0004A

Figure 2-7. Attaching Angle Brackets

4. Refer to Figure 2-8 and attach each flange to the HRPSU as follows.

- When the HRPSU is to be mounted to single posts (center-of-gravity mount), attach the brackets with the flange facing the rear of the HRPSU, as shown on the left.
- When the HRPSU is to be mounted to double posts (flush mounted, as in Figure 2-8), reverse the brackets, as shown on the right in Figure 2-8. The front of the HRPSU will be flush with the rack-mounted network devices.

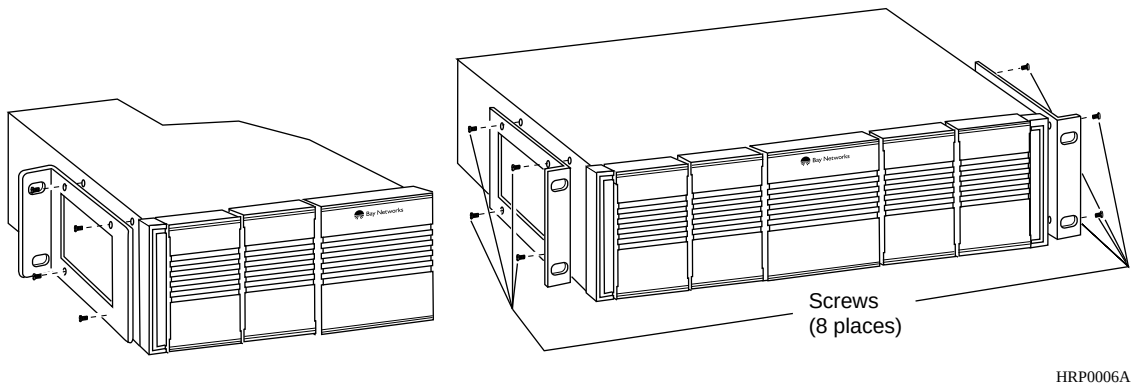
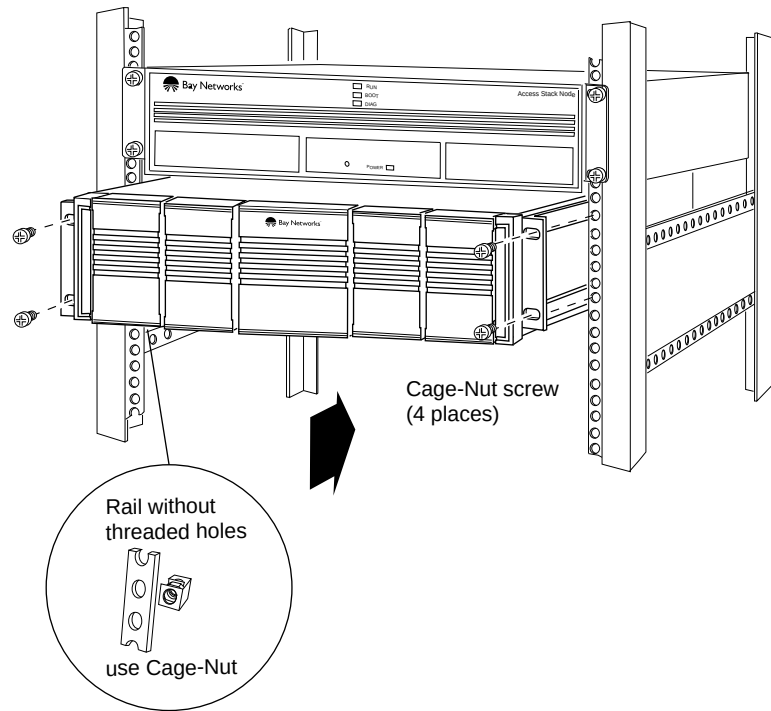


Figure 2-8. Attaching Flanges to the ASN

5. Place the HRPSU on the angle brackets in the rack. Align the flange holes with the holes in the front vertical supports on the rack (Figure 2-9).

If the rack holes are *not threaded*, place cagenuts over them.



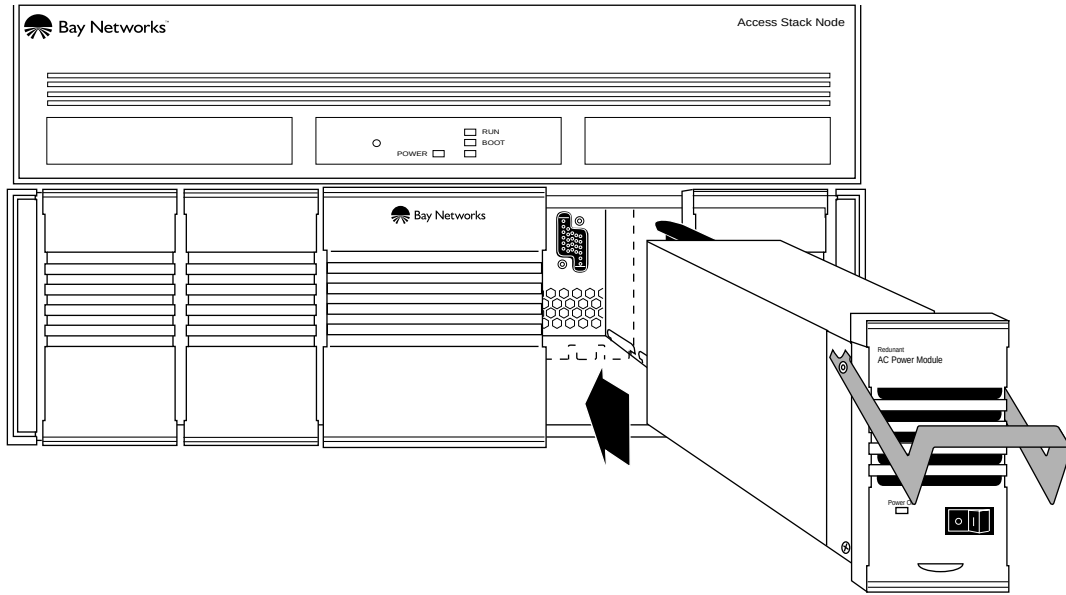
HRP0007A

Figure 2-9. Mounting the HRPSU in an Enclosure Rack

- 6. Insert a 10-32 screw through each flange hole and into the corresponding holes in the front vertical supports of the rack.**
- 7. Tighten the screws with a Phillips screwdriver.**

Installing a Power Supply Module in the HRPSU Power Rack

The HRPSU power rack and the power supply modules are packaged separately. You must install the power supply modules in the HRPSU power rack. You can fill the slots in any order. [Figure 2-10](#) shows a power supply module being inserted into the HRPSU power rack.



HRP0009A

Figure 2-10. Inserting Power Supply Module in HRPSU Power Rack

Install the power supply module using the following steps:

1. **From any slot, remove the blank front panel as follows: with your fingers under the top edge of the panel, pull outward. Discard the panel.**
2. **Lift the latch of the power supply module and slide the module straight into the slot between the side rails. The flange on the back of the module releases the safety door as the module pushes the door up.**

When the module cannot go any farther, it is connected to the backplane.

3. **Push the latch down firmly to lock the module in place.**

Connecting Cables and Switching on Power

When you have installed the power supply modules in the HRPSU power rack, you can connect the network devices to the HRPSU. For best results, connect all cables and turn on the power switches in the following order:



Note: The network device power does NOT have to be turned off for this procedure.

1. Using the cabling option that applies to your system (see Figures [2-1](#) through [2-4](#)), plug the cable(s) into the network device(s) that will attach to the HRPSU.
 2. Tighten the captive screws.
-



Note: A power module must be in the same slot as the cable.

3. If you are using a 24-pin cable, place an EMI gasket over the connector (see Figure 2-1) before attaching a cable to the HRPSU.
4. Plug the cable(s) into the HRPSU and tighten the captive screws.
5. When all cables are plugged in, plug the HRPSU AC power cord into the HRPSU and into a wall outlet.
6. Turn on the power switch on the back of the HRPSU power rack.
7. Turn on the power switch to each power supply module being used. (The switch does not have to be on for any module not being used.)

8. Verify that the power is on by checking the LED on each HRPSU power supply module being used, and the redundant power supply LED on the network device(s). Refer to [Table 2-2](#) for the meaning of the status indicators.

Table 2-2. Status Indicators

LED	Color	Meaning
HRPSU Module: Power OK	Green	The HRPSU is capable of sending power to the network device if needed.
	Dark	The HRPSU is not connected to the network device.
Network Device: Redundant Power LED	Green	The device is connected to the HRPSU and can receive power if needed.
	Dark	The network device is not connected to the HRPSU.
Network Device: Fan LED*	Amber	A fan has stopped in the network device or in an HRPSU power supply module.
	Dark	All fans are functioning.
*Note: Not all network devices have a fan LED.		

If the Power Module Doesn't Turn On

1. Make sure that the power switch on the front of all power supply modules being used is On. (The switches on unused power supply modules do not have to be on.)
2. Make sure that the power cord is plugged in to the HRPSU and the wall outlet, and that the AC power switch on the rear of the HRPSU is ON.
3. Make sure that all connections are tight.
4. Turn off the power supply modules power switch and turn it on again to reset the power supply module.

Chapter 3

Maintaining the HRPSU

The HRPSU requires little maintenance. You should not open the HRPSU chassis. If you have any problems, please call a qualified technician.



Danger: Due to high energy hazards, only qualified service personnel are permitted to install or replace components inside the HRPSU chassis.

Replacing a Power Supply Module in the HRPSU

You can easily replace a power supply module in the HRPSU power rack if necessary. The power on the HRPSU and the Network Device(s) can stay on, and the cables can be left in place for this procedure.

[Figure 3-1](#) shows a power supply module with the latch lifted.

Replace a power supply module using the following steps:

1. **Turn off the power supply switch on the front of the HRPSU module to be replaced.**
2. **Lift the latch on the front of the module, and using it as a handle, pull the module straight out of the slot. When the module is removed, the safety door falls shut and locks into place.**
3. **Lift the latch of the new power supply module and slide the module straight into the slot between the side rails. The flange on the back of the module releases the safety door as the module pushes the door up.**
4. **When the module cannot go any farther, it is connected to the backplane. Push the latch down firmly to lock the module in place.**

5. Turn on the power supply module's switch and verify that the green Power OK LED is lighted.

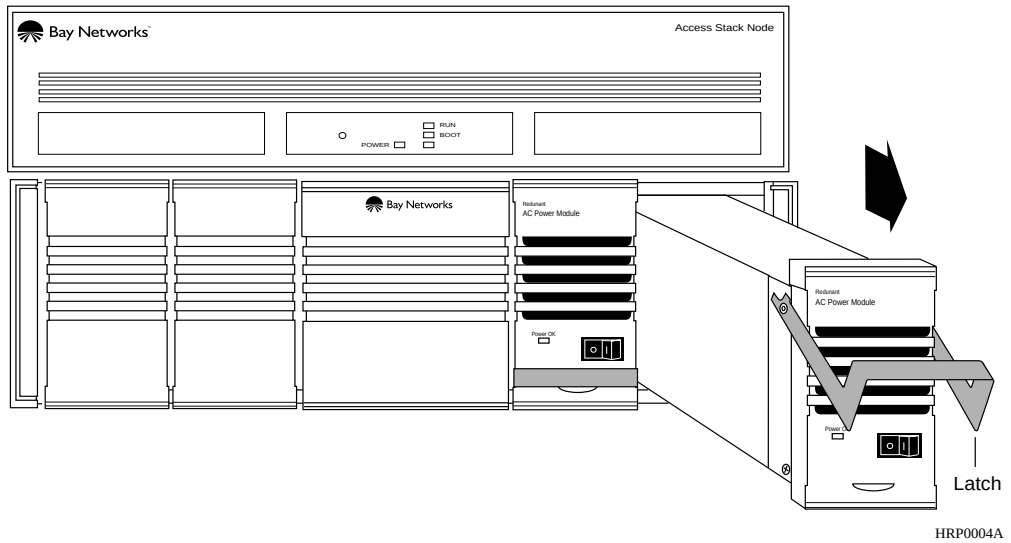


Figure 3-1. Removing Power Supply Module from HRPSU Power Rack

Appendix A

Technical Specifications

Table A-1. Physical Specifications

HRPSU Power Rack	Dimensions: (H) 5.25 in. by (W) 17.5 in. by (D) 17 in. (H) 13.33 cm by (W) 44.45 cm by (D) 43.18 cm Weight: 20 lb (9.08 kg)
Power Supply Module	Weight: 5.15 lb (2.34 kg)

Table A-2. Environmental Requirements

Operating temperature	10° to 40° C
Cooling	12-V DC ball-bearing fan inside each power supply module

Table A-3. Wall Receptacle Requirements

Country	Receptacle	Voltage
North America and Japan	National Electrical Manufacturers Association (NEMA)	10 A, 200 - 240 V 15 A, 100 - 120 V
Any other country	Standard wall receptacle	200 - 240 V

Table A-4. Electrical Specifications

Electrical	Line frequency: 47 to 63 Hz Voltage amperes rating: 1200 VA Input power: 1150 W Input voltage: 100 to 240 V Input current rating: 12 - 7 A Output voltages: +5 V @ 40 A +12 V @ 4.5 A -12 V @ 0.5 A
Safety agencies	UL-listed Certified to CSA standards TUV-licensed
Thermal rating	4000 BTU maximum, fully powered chassis

About This Guide

This guide explains how to mount, install, and maintain a Bay Networks™ HRPSU (High Power Redundant Power Supply Unit), and how to connect it to network devices.

This guide assumes that you have experience installing computer equipment.

Related Documentation

For information about the network devices that can attach to the HRPSU, see the Bay Networks home page on the World Wide Web. The Bay Networks URL is *<http://www.baynetworks.com>*.

For information about your particular network device, refer to the manual that was supplied with it.

Ordering Bay Networks Publications

To purchase additional copies of this document or other Bay Networks publications, order by part number from the Bay Networks Press™ at the following telephone or fax numbers:

- Telephone - U.S./Canada 1-888-4BAYPRESS
- Telephone - International 1-510-490-4752
- Fax 1-510-498-2609

You can also use these numbers to request a free catalog of Bay Networks Press product publications.

Figures

Figure 1-1.	HRPSU (High Power Redundant Power Supply Unit)	1-1
Figure 1-2.	HRPSU Power Rack and Power Supply Module	1-2
Figure 1-3.	Rear View of HRPSU	1-3
Figure 2-1.	Cabling with One 24-Pin Cable	2-2
Figure 2-2.	Adapter for 16-Pin Cable Conections	2-3
Figure 2-3.	Cabling with One 16-Pin Cable	2-5
Figure 2-4.	Cabling with Two 16-Pin Cables	2-6
Figure 2-5.	HRPSU Mounted on a Surface	2-7
Figure 2-6.	Locating the Rail Holes	2-9
Figure 2-7.	Attaching Angle Brackest	2-10
Figure 2-8.	Attaching Flanges to the HRPSU.....	2-11
Figure 2-9.	Mounting the HRPSU in an Enclosure Rack.....	2-12
Figure 2-10.	Inserting Power Supply Module in HRPSU Power Rack.....	2-13
Figure 3-1.	Removing Power Supply Module from HRPSU Power Rack	3-2

Tables

Table 2-1. Options for Cabling a Network Device 2-1

Table 2-2 Status Indicators 2-15

Table A-1. Physical Specifications A-1

Table A-2. Environmental Requirements A-1

Table A-3. Wall Receptacle Requirements A-1

Table A-4. Electrical Specifications A-2

Contents

About This Guide

Related Documentation	xiii
Ordering Bay Networks Publications	xiii

Technical Support and Online Services

Bay Networks Customer Service	xvi
Bay Networks Information Services	xvii
World Wide Web	xvii
Customer Service FTP	xvii
Support Source CD	xviii
CompuServe	xviii
InfoFACTS	xix
How to Get Help	xix

Chapter 1

Overview of the HRPSU

Introduction to the HRPSU	1-1
Preparing for Installation	1-4

Chapter 2

Installing the HRPSU

Cabling Options	2-1
Using One 24-Pin Cable	2-2
Installing an Adapter for 16-Pin Cables	2-3
Using One 16-Pin Cable	2-4
Using Two 16-Pin Cables	2-5
Mounting the HRPSU	2-6
Mounting the HRPSU on a Surface	2-6
Mounting the HRPSU in a Rack	2-8

Installing a Power Supply Module in the HRPSU Power Rack 2-13

Connecting Cables and Switching on Power 2-14

 If the Power Module Doesn't Turn On 2-15

Chapter 3
Maintaining the HRPSU

Replacing a Power Supply Module in the HRPSU 3-1

Appendix A
Technical Specifications

Technical Support and Online Services

To ensure comprehensive network support to our customers and partners worldwide, Bay Networks Customer Service has Technical Response Centers in key locations around the globe:

- Billerica, Massachusetts
- Santa Clara, California
- Sydney, Australia
- Tokyo, Japan
- Valbonne, France

The Technical Response Centers are connected via a redundant Frame Relay Network to a Common Problem Resolution system, enabling them to transmit and share information, and to provide live, around-the-clock support 365 days a year.

Bay Networks Information Services complement the Bay Networks Service program portfolio by giving customers and partners access to the most current technical and support information through a choice of access/retrieval means. These include the World Wide Web, CompuServe, Support Source CD, Customer Support FTP, and InfoFACTS document fax service.

Bay Networks Customer Service

If you purchased your Bay Networks product from a distributor or authorized reseller, contact that distributor's or reseller's technical support staff for assistance with installation, configuration, troubleshooting, or integration issues.

Customers can also purchase direct support from Bay Networks through a variety of service programs. As part of our PhonePlus™ program, Bay Networks Service sets the industry standard, with 24-hour, 7-days-a-week telephone support available worldwide at no extra cost. Our complete range of contract and noncontract services also includes equipment staging and integration, installation support, on-site services, and replacement parts delivery -- within approximately 4 hours.

To purchase any of the Bay Networks support programs, or if you have questions on program features, use the following numbers:

Region	Telephone Number	Fax Number
United States and Canada	1-800-2LANWAN; enter Express Routing Code (ERC) 290 when prompted (508) 436-8880 (direct)	(508) 670-8766
Europe	(33) 92-968-300	(33) 92-968-301
Asia/Pacific Region	(612) 9927-8800	(612) 9927-8811
Latin America	(407) 997-1713	(407) 997-1714

In addition, you can receive information on support programs from your local Bay Networks field sales office, or purchase Bay Networks support directly from your authorized partner.

Bay Networks Information Services

Bay Networks Information Services provide up-to-date support information as a first-line resource for network administration, expansion, and maintenance. This information is available from a variety of sources.

World Wide Web

The Bay Networks Customer Support Web Server offers a diverse library of technical documents, software agents, and other important technical information to Bay Networks customers and partners.

A special benefit for contracted customers and resellers is the ability to access the Web Server to perform Case Management. This feature enables your support staff to interact directly with the network experts in our worldwide Technical Response Centers. A registered contact with a valid Site ID can

- View a listing of support cases and determine the current status of any open case. Case history data includes severity designation, and telephone, e-mail, or other logs associated with the case.
- Customize the listing of cases according to a variety of criteria, including date, severity, status, and case ID.
- Log notes to existing open cases.
- Create new cases for rapid, efficient handling of noncritical network situations.
- Communicate directly via e-mail with the specific technical resources assigned to your case.

The Bay Networks URL is *<http://www.baynetworks.com>*. Customer Service is a menu item on that home page.

Customer Service FTP

Accessible via URL *<ftp://support.baynetworks.com>* (134.177.3.26), this site combines and organizes support files and documentation from across the Bay Networks product suite, including switching products from our Centillion™ and Xylogics® business units. Central management and sponsorship of this FTP site lets you quickly locate information on any of your Bay Networks products.

Support Source CD

This CD-ROM -- sent quarterly to all contracted customers -- is a complete Bay Networks Service troubleshooting knowledge database with an intelligent text search engine.

The Support Source CD contains extracts from our problem-tracking database; information from the Bay Networks Forum on CompuServe; comprehensive technical documentation, such as Customer Support Bulletins, Release Notes, software patches and fixes; and complete information on all Bay Networks Service programs.

You can run a single version on Macintosh Windows 3.1, Windows 95, Windows NT, DOS, or UNIX computing platforms. A Web links feature enables you to go directly from the CD to various Bay Networks Web pages.

CompuServe

For assistance with noncritical network support issues, Bay Networks Information Services maintain an active forum on CompuServe, a global bulletin-board system. This forum provides file services, technology conferences, and a message section to get assistance from other users.

The message section is monitored by Bay Networks engineers, who provide assistance wherever possible. Customers and resellers holding Bay Networks service contracts also have access to special libraries for advanced levels of support documentation and software. To take advantage of CompuServe's recently enhanced menu options, the Bay Networks Forum has been re-engineered to allow links to our Web sites and FTP sites.

We recommend the use of CompuServe Information Manager software to access these Bay Networks Information Services resources. To open an account and receive a local dial-up number in the United States, call CompuServe at 1-800-524-3388. Outside the United States, call 1-614-529-1349, or your nearest CompuServe office. Ask for Representative No. 591. When you are on line with your CompuServe account, you can reach us with the command **GO BAYNET**.

InfoFACTS

InfoFACTS is the Bay Networks free 24-hour fax-on-demand service. This automated system has libraries of technical and product documents designed to help you manage and troubleshoot your Bay Networks products. The system responds to a fax from the caller or to a third party within minutes of being accessed.

To use InfoFACTS in the United States or Canada, call toll-free 1-800-786-3228. Outside North America, toll calls can be made to 1-408-764-1002. In Europe, toll-free numbers are also available for contacting both InfoFACTS and CompuServe. Please check our Web page for the listing in your country.

How to Get Help

Use the following numbers to reach your Bay Networks Technical Response Center:

Technical Response Center	Telephone Number	Fax Number
Billerica, MA	1-800-2LANWAN	(508) 670-8765
Santa Clara, CA	1-800-2LANWAN	(408) 764-1188
Valbonne, France	(33) 92-968-968	(33) 92-966-998
Sydney, Australia	(612) 9927-8800	(612) 9927-8811
Tokyo, Japan	(81) 3-5402-0180	(81) 3-5402-0173

